AD-A265 162

REPOR

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	April 1993	professional paper

4. TITLE AND SUBTITLE

FEATURE ASSOCIATION WITHOUT A MOTION ESTIMATE

5. FUNDING NUMBERS

In-house funding

6. AUTHOR(S)

R. L. Ricks

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Naval Command, Control and Ocean Surveillance Center (NCCOSC)
RDT&E Division
San Diego, CA 92152-5001

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Naval Command, Control and Ocean Surveillance Center (NCCOSC)
RDT&E Division
San Diego, CA 92152-5001

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

The problem of associating the features of a moving object in sequential images without estimates of object motion or structure (relative position of features) is addressed. A method is presented and analyzed for associating features even if some of the features are occluded (not visible in one or more of the images of interest). The method models the object as a rigid set of point reflectors each with independent reflectivity that is correlated from image to image. (Compare with Swerling case 3.) Object motion is modeled as a circular trajectory in a known plane. It requires measurements of position plus Doppler. Such measurements are available from monopulse radar and some sonar and laser imaging systems. The method assumes all possible associations and minimizes the least trimmed squares (LTS) of error residuals to remove erroneous associations. Byproducts of the minimization include estimates of object motion and feature structure.

93 5 . . 08 5

93-12069

14. SUBJECT TERMS

15. NUMBER OF PAGES

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	SAME AS REPORT

21a. NAME OF RESPONSIBLE INDIVIDUAL	21b. TELEPHONE (Include Area Code)	21c. OFFICE SYMBOL
R. L. Ricks	(619) 553 - 1646	Code 572

Feature Association

Without a Motion Estimate

1 ABSTRACT

The problem of associating the features of a moving object in sequential images without estimates of object motion or structure (relative position of features) is addressed. A method is presented and analyzed for associating features even if some of the features are occluded (not visible in one or more of the images of interest). The method models the object as a rigid set of point reflectors each with independent reflectivity that is correlated from image to image. (Compare with Swerling case 3.) Object motion is modeled as a circular trajectory in a known plane. It requires measurements of position plus Doppler. Such measurements are available from monopulse radar and some sonar and laser imaging systems. The method assumes all possible associations and minimizes the least trimmed squares (LTS) of error residuals to remove erroneous associations. Byproducts of the minimization include estimates of object motion and feature structure.